U.S. Geological Survey, recent and ongoing studies in the Williston Basin. November 2013.

	Year	Project Title	USGS contact(s)	Published paper, data source, on-going study, etc.	Link	Relevant information	Keywords
1	2003-present	Delineation of brine contamination in and near the East Poplar oil field, Fort Peck Indian Reservation, northeastern Montana	•Joanna Thamke, Montana Water Science Center •Zell Peterman, Crustal Geophysics and Geochemistry Center •Bruce Smith, Crustal Geophysics and Geochemistry Center •Todd Preston, Northern Rocky Mountain Science Center	USGS WRIR 2003-4214; USGS OFR 2006-1216; USGS OFR 2010-1326, USGS SIR in preparation	http://mt.water.usgs.gov/projects/east_poplar/index.html	Project assesses brine contamination to the shallow aquifers and surface water.	Energy Development, Williston Basin, Brine contamination, Groundwater, Surface Water, East Poplar oil field, Fort Peck Indian Reservation
2	2008-present	Brine Contamination to Prairie Potholes from Energy Development in the Williston Basin	•Robert Gleason, Northern Prairie Wildlife Research Center •Joanna Thamke, Montana Water Science Center •Brian Tangen, Northern Prairie Wildlife Research Center •Todd Preston, Northern Rocky Mountain Science Center •Tara Chesley-Preston, Northern Rocky Mountain Science Center •Bruce Smith, Crustal Geophysics and Geochemistry Center	USGS FS 2011-3047; Applied Geochemistry August 24, 2012; USGS OFR 2012-1149; Montana State University Thesis 2011, USGS SIR in preparation	http://steppe.cr.usgs.gov/ http://pubs.usgs.gov/of/2012/1149/	Water-quality impacts of brine spills, spatial data on wells, decision analysis findings	Energy Development, Williston Basin, Brine Contamination, Prairie Potholes, Wetlands, Groundwater
3	2010-present	Water Balances for Energy Resource Production	•Seth Haines, Central Energy Resources Science Center •Joanna Thamke, Montana Water Science Center	On-going study, publication in preparation	http://energy.usgs.gov/HealthEnvironment/EnergyProductionUse/ProducedWaters.aspx	Water availability	Energy Development, Williston Basin, Groundwater, Surface Water
4	2011-2012	A GIS-Based Vulnerability Assessment of Brine Contamination to Aquatic Resources from Oil and Gas Development in Eastern Sheridan County, MT	•Todd M. Preston, Northern Rocky Mountain Science Center •Tara L. Chesley-Preston, Northern Rocky Mountain Science Center •Joanna N. Thamke, Montana Water Science Center	Completed. Publication in press	http://steppe.cr.usgs.gov/pdf/AWRA_2012_poster_Final.pdf	Vulnerability assessment methods	Energy Development, Williston Basin, Brine Contamination, Vulnerability Assessment
5	2012-2015	Williston and Powder River basins groundwater availability	•Joanna N. Thamke, Montana Water Science Center •Andrew Long, South Dakota Water Science Center •Gary LeCain, Office of Groundwater •Tim Bartos, Wyoming Water Science Center	South Dakota School of Mines Theses 2013, USGS publications in preparation	http://mt.water.usgs.gov/projects/WaPR/	Groundwater availability determined for current and projected energy development	Energy Development, Williston Basin, Powder River Basin, Groundwater Availability
6	2012-present	Investigating the biological impacts of brine contamination on wetlands of the Prairie Pothole Region: Developing maps depicting conditions in the ecosystems	•Todd M. Preston, Northern Rocky Mountain Science Center •Tara L. Chesley-Preston, Northern Rocky Mountain Science Center	On-going study		Biological impacts of brine contamination	Energy Development, Williston Basin, Brine Contamination, Biological Impacts, Prairie Potholes, Wetlands
7	2012-present	Spatial characterization of wetland surface water contamination risk from oil development in the Prairie Pothole Region of North Dakota	•Max Post van der Burg, Northern Prairie Wildlife Research Center •Brian Tangen, Northern Prairie Wildlife Research Center •Robert Gleason, Northern Prairie Wildlife Research Center •Jill Frankforter, Montana Water Science Center	On-going study, publication in preparation		Impacts of brines on wetland surface water chemistry	Energy Development, Williston Basin, Brine Contamination, Prairie Potholes, Wetlands
8	2012-present	Baseline Chemical and Isotopic Data for Produced Water from the Bakken Formation, Williston Basin	•Zell Peterman, Crustal Geophysics and Geochemistry Science Center •Rod Caldwell, Montana Water Science Center •Joel Galloway, North Dakota Water Science Center	Data available in USGS National Water Information System at http://mt.water.usgs.gov/		Characterize Bakken Formation water	Energy Development, Williston Basin, Bakken Formation, Strontium Isotopes
9	2012-2015	Effects of oil and gas development on grassland birds	•Doug Johnson, Northern Prairie Wildlife Research Center	On-going study		Biological impacts of energy development	Grassland birds, Oil and gas development
10	2013-2014	Presence and Abundance of Invasive Species and Non-Native Perennial Grasses Related to Energy Development in Montana and North Dakota	•Todd M. Preston, Northern Rocky Mountain Science Center •Rick Sojda, Northern Rocky Mountain Science Center •Tara L. Chesley-Preston, Northern Rocky Mountain Science Center	On-going study		The effects of energy development on the presence and abundance of noxious weeds	Energy Development, Williston Basin, Invasive Species, Noxious Weeds
11	2013	Comprehensive Wetland Assessment and Monitoring Program within the Lostwood Complex of Northeast Montana and Northwest North Dakota	•Todd M. Preston, Northern Rocky Mountain Science Center •Rick Sojda, Northern Rocky Mountain Science Center •Tara L. Chesley-Preston, Northern Rocky Mountain Science Center	Final report to U.S. Fish & Wildlife Service in preparation		Use previously determined vulnerability assessment methods for Waterfowl Production Areas in the Lostwood National Wildlife Refuge Complex	Energy Development, Williston Basin, Waterfowl Production Areas, Brine Contamination, Vulnerability Assessment
12	2013	Williston Basin Baseline Water-Quality Assessment	•Peter McMahon, Colorado Water Science Center •Jill Frankforter, Montana Water Science Center •Joel Galloway, North Dakota Water Science Center; •Greg Delzer, South Dakota Water Science Center	On-going study		Characterize baseline water-quality conditions in the Upper Fort Union aquifer within the Williston Basin, Montana and North Dakota	Energy Development, Williston Basin, Water Quality, Baseline
13	2013	Isotopic Indications of Fluid Flow in the Bakken Formation, Williston Basin	•Zell Peterman, Thomas Oliver, and Kiyoto Futa, Crustal Geophysics and Geochemistry Science Center	On-going study		Sr isotopic characterization of pore salts in members of the Bakken to evaluate flow amount units	Energy Developpment, Williston Basin, flow in Bakken Fm
14	2013	Landscape Change, Ecological Impacts, and DOI Information needs Associated with Energy Production in the Williston Basin, Northern Great Plains	•Robert Gleason, Northern Prairie Wildlife Research Center •Brian Tangen, Northern Prairie Wildlife Research Center •Gregg Wiche, North Dakota Water Science Center •Greg Delzer, South Dakota Water Science Center •David Naftz, Wyoming-Montana Water Science Center •Aida Farag, Jackson Research Station	On-going study		Comprehensive water resources monitoring and assessment plan, Description of landscape changes and development of landuse change scenarios, Develop and maintain landscape data on oil and gas development for use by partners, Possible relationships between oil and gas development and wildlife, Methods for identifying produced waters and modeling future water chemistry, Salt toxicity (from produced waters) thresholds for aquatic species, Sedimentation impacts to water resources from pipeline construction, Water-crossing hazard assessment	Energy Development, Williston Basin, Water Quality, Bakken Formation, Hydraulic Fracturing
15	2013-2014	Analyses of water-quality data and resources on the Fort Berthold Reservation, North Dakota	•Tony Ranalli, Colorado Water Science Center, •Robert Lundgren, North Dakota Water Science Center	On-going study, publication in preparation		Analyses of water-quality data and resources on the Fort Berthold Reservation, North Dakota	Water-quality, groundwater, streams, springs, lakes, Fort Berthold Reservation, North Dakota
16	2013-2014	Quantifying water-use requirements for the variable conditions and processes associated with hydrulic fracturing within North Dakota, South Dakota, and Montana	•Kyle Blasch (Wyoming-Montana Water Science Center)	On-going study		Quantifying water-use requirements for the variable conditions and processes associated with hydrulic fracturing within North Dakota, South Dakota, and Montana	Energy development, Williston Basin, Bakken Formation, Three Forks Formation, hydraulic fracturing, water-use requirements

17	2014	Updating, gathering and serving datasets relevant to oil and gas development and fish and wildlife management within the Williston Basin and Bakken Formation.	•Tara L. Chesley-Preston, Northern Rocky Mountain Science Center	On-going study		Updating, gathering, and serving datasets relevant to energy development and natural resources to ScienceBase and a NOROCK server	Energy Development, Williston Basin, Bakken Formation, Water Quality, Hydraulic Fractioning, GIS, Data Server, Webmap
18	2014	Evaluating recent and future land-use changes related to energy development in the Williston Basin and Bakken Formation.	•Todd M. Preston, Northern Rocky Mountain Science Center	On-going study		Determine the acreage of different land-use classifications converted to current and future oil and gas development	Energy Development, Williston Basin, Bakken Formation, Land Use
19	2014	A Web-Based Tool to Evaluate Potential Saline Contamination to Aquatic Resources in the Williston Basin from Energy Development	•Tara L. Chesley-Preston, Northern Rocky Mountain Science Center •Todd M. Preston, Northern Rocky Mountain Science Center	On-going study		Integrate several datasets into a cohesive data product allowing federal,state,tribal, and others to visualize the spatial distribution of factors relevant to brine contamination and determine potential vulnerability.	Energy Development, Williston Basin, Vulnerability Assessment, Brine Contamination, Aquatic Resources